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COMPARISON OF AVAILABLE PHOSPHORUS EXTRACTANTS IN ACID SOIL

In acid soils only a small portion (one per cent or even less) of the total soil phosphorus is plant available. In the rubber growing soils, the available P as estimated by Bray II is generally less than 2 per cent of the total P content (Karthikakuttyamma *et al.*, 1991). For the routine soil test programmes, phosphorus availability of the soil is judged using different extractants *viz.*, Bray I and-II (Bray and Kurtz, 1945) and Olsen's 0.5 M $NaHCO_3$ (Olsen *et al.*, 1954), which extract a part of phosphate from the Al-P, Fe-P and Ca-P fractions (Jackson, 1958). All these extractants give an idea about the intensity of the soil phosphorus, whereas palnts during growth take up a good share from the soil reserve also. Holford (1980) based on a glass house study reported that acid ammonium fluoride and sodium bicarbonate solutions were over sensitive to buffering capacity of acid soils and underestimated the available phosphate. In this context, the anion exchange resin (AER) of high absorption capacity is advantageous since these resins simulate the plant root system by creating a sink for the phosphate ions in solution. Amer *et al.* (1955) had done detailed experiments on the use of anion exchange resin and standardised the procedure for its use in soil phophorus availabity evaluations. The following equation explains the uniqueness of AER extraction for available P estimations in soil:

$$\text{Soil P} \rightleftharpoons \text{Solution P} \longrightarrow \text{AER P}$$

Once adsorbed in the resin it can be separated out from the soil water system and the phosphate in solution can be determined conveniently after displacing the phosphate with other anions like chloride. In this communication we report the results of an experiment done to compare the different extractants with respect to soil P availability.

Soil samples of a pot culture experiment conducted to study the cover crop mediated turn over of phsophorus from different sources of rock phosphates *viz.*, Mussoorie rock phosphate, Udaipur rock phosphate, North Carolina rock phosphate and single super phosphate along with a control in soils of rubber (*Hevea brailiensis*) plantations were used for the present investigation. The cover crops raised were *Pueraria phaseoloides* and *Mucuna bracteata.* The soil used was a clay loam lateritic soil (clayey skeletal kaolinitic isohypothermic Typic Kandiustox) with a pH of 5.3 and cation exchange capacity of 12.3 C.mol (P^+) per kg soil. Soil samples from each of the pots were collected separately and the available P content was estimated by extraction with Olsen's 0.5M $NaHCO_3$, Bray I and II solutions and anion exchange resin. P in the extracted solutions was estimated colorimetrically using chloromolibdic stannous chloride reduction method (Dickman and Bray, 1940). For uniformity of samples in the different methods, 100 mesh soil was used in all estimations. In the Olsen's procedure 5g of the soil was shaken with 25 ml of the bicarbonate solution for 30 min and filtered after adding a measured quan-